Botanical Gazette.

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Editorial.—DR. ASA GRAY will return to this country during the first weeks of September. He is heartily welcomed home by all botanists, few of whom have not reason to thank him for repeated favors.

DR. GEO. L. GOODALE has earned a year's relief from class work. He sailed September 3 for Germany where he will try to find much needed rest. The burden of a popular professorship, an extensive botanical garden, and other university duties is heavy enough at best; but add to all this repeated sickness at home and it will tax the strength of the strongest.

ERRATUM. In Mr. Lennon's article on page 248 of the last GAZETTE, *Hieracium aurantium* should read *H. aurantiacum.*

DR. FRITZ MULLER has discovered in Brazil two kinds of stamens of different function in the same flower. The plant is a species of *Heeria* (*Melastomaceæ*) and the two sets of stamens are distinguished by short filaments with yellow anthers, and long filaments with red anthers, the color of the petals. The parts are so arranged that an insect plundering the conspicuous yellow anthers will have its body well dusted with the pollen of the other set.

M. STORBZL assures us that the slow immersion of a fresh plant in a boiling solution of one part of salicylic acid in 600 parts of alcohol, and then shaking off superfluous moisture, previous to pressing in the usual way between blotting paper, will more nearly preserve the natural color than any other method.

MR. H. W. RAVENEL in the August *Torrey Bulletin* describes the peculiar habit observed in *Asclepias amplexicaulis.* It is a case of apparently one-ranked leaves, caused by the stems assuming a recumbent position and twisting alternately from right to left and from left to right. In this way both surfaces of the leaf are exposed alike to the sun.

MR. W. H. LEGGETT in the September number of the same periodical has a most interesting note on the "Fertilization of *Rhexia Virginica.*" The minute pore found in the anthers has often been thought of insufficient capacity to provide an escape for the pollen. Mr. Leggett finds that the inflated sacks at the base of the anthers act as bellows and that when a bee treads upon them they yield to the pres-

sure and force through the minute pore a jet of pollen "directly upon the rear or side of the intruder." He states that in experimenting a surprising quantity of pollen was thrown by touching the "bellows" with a blunt point.

PROF. C. E. BESSEY is making the Botanical Department of the *American Naturalist* more valuable than it has been for years. It is kept abreast with the times and botanists get hints of all that is doing in the botanical world.

THE AMERICAN MICROSCOPICAL JOURNAL for August contains a useful list of preservative solutions for botanical preparations. It is taken from *Brebissonia*, reprinted there from an opuscle published in 1872 by Messrs. Cornu, Gronland and Rivet. In the same number a few filterings of Croton water in August are shown to yield 24 species of Algæ, not to mention numerous Diatoms.

MR. J. G. BAKER has begun a synopsis of the genus *Pitcairnia* in the *Journal of Botany* for August. This is one of the largest genera of *Bromeliaceæ*, numbering now seventy species. In this first number a key to the species is given and eighteen of them described.

DR. GRAY gives in the last *American Journal of Science* a review of the third volume of DeCandolle's *Monographiæ Phaenogamarum*. This volume contains over 1000 pages and is mostly devoted to the two orders *Commelinaceæ* and *Cucurbitaceæ*. The former is by C. B. Clarke; the latter is the work of Cogniaux, of Belgium. The order *Commelinaceæ* contains 307 known species, arranged under 26 genera. The order is chiefly tropical, finding its most northern limits in the Northern United States or British America. Two-thirds of the large volume is devoted to *Cucurbitaceæ*, an order which had been elaborated for the Prodromus by Seringe over fifty years ago. Since that time the material has increased tenfold, and of the 600 species M. Cogniaux describes 219, and has seen all but eight! Dr. Gray remarks: "The geographical distribution of a family at once so peculiar, so wide-spread and so considerable in numbers and generic diversity (79 genera and 600 species), might raise interesting speculations. It must be an ancient family; for the numerous genera, as well as the species, are circumscribed in range, and only six or seven are common to the Old and New World, except as diffused under human agency."

PROF. W. J. BEAL sets his students all to work, and the results of their observations form no mean contribution to botanical science. The latest we have noted are recorded in Meehan's *Gardener's Monthly* for September. Three students have been trying to answer the question, "Will red clover not visited by bees produce seeds?" The results of the experiments given seem to show that when guarded from bees the heads sometimes set seed, but always in very much diminished quantity.

Chapmannia and Garberia.—There is nothing more difficul than to describe a plant so that a person who has never seen it may

form a correct conception of its appearance. The characteristic *aspect* of a plant can only be described by comparison. The best of dried specimens fail to show all. That subtile quality which corresponds to expression is often wholly lost. This quality is sometimes of varietal importance, and its loss in drying often renders apparent a relationship difficult to perceive in the living plants. Detailed descriptions or field notes relative to most southern plants would hardly be admissable to the pages of the GAZETTE, but there are two plants with which I am sure its readers will be glad to be made better acquainted, because of their association, by name, with two of our most zealous botanists, namely, Dr. A. W. Chapman and Dr. A. P. Garber. This association appears the more fitting when we consider that these two plants are strictly Floridian, and that the botanists whose names they bear have distinguished themselves most by their labor s in Florida.

The *Chapmannia Floridana* and *Garberia fruticosa* are confined not only to Florida but to the center of that State. This range, however, is not nearly so limited as has been supposed. Dr. Chapman described both as growing in eastern Florida. In the course of my travels I have found *Chapmannia* in abundance from Fort Ogden, in Manatee Co., to Ocala, in Marion Co., a distance of 150 miles. *Garberia* I have found on the western coast at Tampa, on the eastern coast near Matanzas, and in the interior near the Ocklawaha. *Garberia* grows only on "spruce-pine ridges," dry "heavy" sands, which make the worst of roads, and best suit that peculiar pine which Dr. Chapman has named *Pinus clausa*.

The *Chapmannia* grows in dry, open woods, and flowers through out May, June and July. Its flowers are showy, but few and ephemeral, otherwise the plant is uninteresting except to the botanist, who finds in it some very noticeable peculiarities. It is a slender plant, sparsely branched, with meager foliage, in habit much like *Desmodium rigidum*. Like most other *Leguminosæ* found in these pine woods, the roots bear slender tubers a few inches below the surface. The stems —one or more from a root—are slender, leafy below, above more or less branched and glandular-hirsute, the calices being quite viscid. The leaves are pubescent beneath, 1′–2′ long, pinnately 3–7 foliolate, and are provided with subulate persistent stipules. The leaflets vary from one-fourth of an inch to nearly one inch in length; they are mostly obovate or oval and obtuse, but they vary from orbicular to narrowly lanceolate, and from acute to retuse, always mucronate and petiolulate. So far we find no marked peculiarities. Let us now proceed to the inflorescence, where generic characters are to be looked for, and note such features as are not mentioned in Chapman's description. That author does injustice to the flowers of his plant; instead of being "small," the perfect flowers are quite large, often an inch and a half in width. Their color is a deep rich yellow, like those of *Stylosanthes*. They open early in the morning, perhaps in the night, and in sunny weather are closed by nine o'clock, scarcely outlasting the dew. As the keel is closely wrapped around the stamens, the flower appears to be tripetalous, the other three large petals spread-

ing in a plane, or being reflexed as in *Cyclamen*. The apparent peduncles are about an inch in length, but these are really peduncle-like branches or the axes of 1–3 flowered racemes, the pedicels being only a line in length, bracted at the base, thickening under the fertile flowers into top-shaped receptacles. When there is more than one flower the terminal one is sterile, the lower and fertile flowers consisting of a pistil only. The legume is somewhat moniliform and consists of from one to four joints, each about one-fourth of an inch long, hispid, the terminal one beaked. The joints disarticulate as readily as do those of *Tripsacum*, the articulations being tumid and oblique, the scars oval and white.

As to the *Garberia* I cannot add much to the published descriptions. It is a shrubby Composite, of cinereous color, unique among cis-Mississippi plants, but similar to some of the shrubby *Compositæ* of the far west. It grows on sterile, sandy ridges, where it forms compact bushes two to four feet in height, with numerous stems and branches, its mode of branching being Ericaceous, like *Azalea*, etc. It is quite leafy, the leaves being obovate and only about an inch in length. The corymbose flowers appear in the fall and are of a dull purple color. It is singular that Nuttall should have called this plant a *Liatris*. Many botanists have considered that great similarity of floral structure is unquestionable evidence of generic identity, and this opinion has led to some very artificial grouping of species. Prof. Gray did well in separating *Liatris fruticosa* from the rest of that genus. It was also highly proper to take out the species *odoratissima* and *paniculata*, but the propriety of erecting a new genus for them is questionable. Familiarity with these plants in the field leads me to believe that their natural position is in the genus *Carphephorus*, to species of which each is closely allied. Only a slight change of generic characters would have been required to establish this very natural group.

—A. H. CURTISS.

Botanical Notes, from Rev. E. J. Hill, Englewood, Illinois.—*Anemone multifida*, DC. Found in flower August 10, 1878, on the sandy beach of Grand Traverse Bay, near the landing at Torch Lake, Mich. A number of specimens were gathered in various states of flower and fruit, showing that it had not ceased blooming since the time it began to flower in early summer.

Cadramine hirsuta, L., var. *sylvatica*. The smooth form, like the original *C. Virginica* described by Michaux, grows in dry, open woods at Highland Park, north of Chicago. It is usually found farther south.

Lepidium campestre, L. Adventive by Ft. Wayne R. R., at Englewood. Only a few plants found.

Hibiscus Moscheutos, L. This plant, with a large and showy flower, grows luxuriantly by Lake George, and in the adjacent swamps near Whiting, Lake county, Indiana. The plants were often five feet or more in height, and the flowers larger than those of the common Hollyhock. I saw it in cultivation at Bear Lake, Manistee county, Mich., in August, 1880. It was brought by emigrants from Ohio. As the land was comparatively dry, and the height of the plants three

feet or more, with flowers large and well formed, the evidence was conclusive that it easily bears cultivation. I learned that the stock from which this was brought was also cultivated.

Hippuris vulgaris, L. Grows in a small stream at Otis, Ind., ten miles west of Laporte. It is the only place where I have seen this plant, comparatively rare, in this vicinity. I do not often meet with it elsewhere, the only time, as I have it recorded, in Bear River, near Petoskey, Mich., and at Frankfort, Mich., both stations on the eastern shore of Lake Michigan.

Cornus Canadensis, L. As in the case of some other species of *Cornus*, this was found both in flower and fruit at Manistee, Mich., August 6, 1880.

Erigeron bellidifolium, Muhl. Specimens with white flowers were found last year at Whiting, Ind. Also those with pale pink rays varying to white. Nearly all the flowers seen the present season are white.

Diplopappus umbeliatus, Torr. & Gr. Plants roughish and pubescent occur at Whiting. Similar forms were found this year at Sault Ste. Marie. Those thickly covered with hair were obtained at Bruce Mine, on the St. Mary River, Ontario.

Bidens Beckii, Torr. This plant, credited in Gray's Manual (and on the same authority in Patterson's Catalogue of Illinois Plants) to Illinois, but without locality, grows in the Calumet River at South Chicago. Occurs also at Manistee, Mich.

Cnicus Pitcheri, Torr. Grows on the sandy shore of Lake Michigan, at Pine Station, Ind. Also found in similar places at Petoskey, Mich. In both places it is associated with *Solidago Virgaaurea.*, L., var. *humilis*, Gray.

Veronica Anagallis, L. Plants glandular hairy (Gray's Syn. Fl. N. A.) are found at South Chicago.

Sparganium minimum, Bauhin. In ponds at Manistee and in "sloughs" at Pine Station. These are the only localities where I have seen this plant during many years of collecting, and it is not abundant in either place.

Potamogeton Claytoni, Tuck. In creeks of Pere Marquette River, Ludington, Mich., forms occur with floating leaves 1½′–3½′ long, and the submersed leaves 7-nerved.

Potamogeton perfoliatus, L. I find typical forms of this in the Little Manistee River, at Manistee, with short, roundish or oval leaves. Nearly all the plants gathered at the West have the lanceolate leaf, usually shorter than in the type specimen (var. *lanceolatus*, Robbins.). They gradually vary with all degrees of difference between the variety and the typical species, so that it is often hard to tell to which they should be assigned.

Potamogeton Niagarensis? Robbins. This plant, probably only a variety of *P. pauciflorus*, Pursh, has been found common in several places near here the past season. I have traced it as far east as Otis, Ind.

Mr. C. F. Wheeler, of Hubbardston, Mich., sends it from his vicinity. Its fruiting season is long. It was gathered with well formed fruit May 28, and found fresh and in fruit as late as September 6.

Potamogeton pauciflorus, Pursh. Typical forms are found at Manistee and Frankfort. These have fine, almost hair-like leaves. I have not yet met with these here, as all the plants seem to have the type of fruit of *P. Niagarensis*, and the leaves broader, with a larger and coarser growth of stem. Both forms usually grow in dense masses, often completely covering or even filling the water if very shallow, the stems being so entangled as to be separated with difficulty. I found none of the form of *P. Niagarensis*, last summer, on the eastern shore of Lake Michigan, between Frankfort and Ludington, unless some broader leaved specimens, growing with *P. pauciflorus*, but without fruit, be of this kind. Those seen this summer at Sault Ste. Marie, and on the east side of St. Mary's River, in Ontario, and at Mackinac have the fine leaf.

Potamogeton pusillus, L., var. *major*, Fries. This plant, hitherto considered very rare and hard to get, grows in great abundance at Manistee, in the lake and river of that name, and in the Aux Becs Scies, at Frankfort. In both these places it was the prevailing form so far as observed. In 1878, while making the "inland passage" between Cheboygan and Petoskey, Mich., a few plants were picked out of Crooked River, but under conditions that did not allow of a determination of its abundance. The evidence is in favor of its being common in the northern part of the southern peninsula of Michigan. This conjecture, made on the evidence of last year's examination of localities in Michigan, has been strengthened by the experience of this summer. All plants of *P. pusillus* seen in the St. Mary's River, at Sault Ste. Marie, were of the var. *major*. Perhaps it is essentially a northern form. It may be looked for in other places east of Lake Michigan, within the limits of that State, and in Wisconsin and northward. Until the present season I had marked it as "rare at South Chicago," having found a few specimens. This season I have found it in fair quantity at this place, thus, in all probability, indicating the range of the plant as co-extensive with Lake Michigan. Near Chicago the forms of *P. pusillus* incline to the var. *tenuissimus*, Mertens & Koch, typical specimens of the plants being hard to find.

Potamogeton marinus, L. This was gathered in Crystal Lake, east of Frankfort. It grows in sand in the shallow water by the margin of the lake. The stems rise from running rootstocks to the height of two to six inches. The stigma is not sessile, but with a short style, differing in this from the type species. Mr. Wheeler sent the same plant for identification, the habitat of which was unfortunately lost To make the determination of the Crystal Lake specimens certain they were sent to Mr. Morong, of Ashland, Mass., and the only difference noticed is the presence of the short style. In the specimens sent by Mr. Wheeler the stigma is more nearly sessile. Since writing the

above I have found plenty of the typical form, like those gathered by Rev. Morong "in shallow rapids at Streets Island above Niagara Falls," mentioned in the BOTANICAL GAZETTE for May, 1880. They grow in the rapids of St. Mary's River. Those found were on the American side, near the head of the rapids. The water is shallow and the bottom thickly covered with pebbles and stones, among which they root. A few were seen above the rapids.

Potamogeton (undetermined). This plant, mentioned in the BOTANICAL GAZETTE of May, 1880, as occuring at Ashtabula, Ohio, and thought to be a variety of *P. zosteræfolius*, Schum., was again found the past season at Manistee. As it grew in abundance, opportunity was given to study it in all stages of growth. The plants gathered at Ashtabula were too few and imperfect to determine with definiteness. It will apparently have to rank as a new species unless identified with some European form. It grows in stagnant water, in the four places where it has yet been seen, in pools or ponds without an outlet. These are common in Michigan, being "kettle-holes" made in the boulder clay of the drift formation. Sunk many feet beneath the rim of surrounding hills, they furnish a fine soil in their slimy bottoms for the growth of aquatic plants.

Broad leaved forms of another *Potamogeton*, allied to *P. pectinatus*, also occur at Manistee and Frankfort. At the time of finding, in August, the fruit was barely formed, too immature for determination. It must ripen in September or October. Apparently the same species was detected in the St. Mary's River the present year. Mr. Morong thinks it may be *P. flabellatus*, Babington, a species found in Europe. The attention of collectors is called to this, that those who may have an opportunity to gather it later in the year may secure some with ripened fruit. It may be looked for in situations in which *P. pectinatus* grows, though on the whole it seems to prefer more rapid water. In the St. Mary's River the current was so strong as to bow the stems, three or four feet long, into a nearly horizontal direction. Some were seen growing in the same condition in the Little Manistee. The broader leaves, the stem pinnately rather than dichotomously branched, and the late fruit, are good external distinctions, between it and *P. pectinatus*. I have found the fruit of the latter well formed as early as June 20. All forms of *P. pectinatus* found at Manistee and Ludington had all the fruit ripe and plants decaying.

It may be added incidentally that the study of these *Potamogetons* furnished good examples of the principle of "compensation in growth." When the leaves of *P. pusillus*, var. *major*, *P. pauciflorus*, and of the last mentioned kind were particularly remarkable for breadth, they were quite uniformly devoid of fruit. They seem to have exhausted their forces in the production of leaves.

Goodyera Menziesii, Lind. Sparingly found at Frankfort. Other stations are Petoskey and Boyne Falls, Northport and along Grand Traverse Bay, Mackinac. Common at Sault Ste. Marie, on the Canada side. Resembles *Goodyera pubescens*, the common form at all

these stations, but it is generally taller and with the leaves striped rather than blotched with white. *Goodyera repens* appears to be uncommon in these localities.

Spiranthes Romanzoviana, Chamisso. Found in bogs at Northport, Mich., by a pond known as Mud Lake. Rather common at Sault Ste. Marie. It closely resembles, externally, *S. cernua*, and might easily be taken for that plant, but generally has broader leaves and blossoms earlier, in July and August.

Listera convallarioides, Hook. Cedar swamps, Bear Lake, Mich., Sault Ste. Marie, Ontario.

Juncus pelocarpus, E. Meyer. Bear Lake, also at Laporte, Ind.

Rhynchospora capillacea, Torr., var. *leviseta*, E. J. Hill. This plant, first detected at Pine Station, Ind., in 1875, and described in the *American Naturalist* the following year, is distinguished from the typical species by its perfectly smooth bristles. It has been observed in the original locality nearly every year since, and preserves the same peculiarity. Last year it was gathered in abundance at Whiting, and found the present season at Edgemoor, between the two stations mentioned above. So far as observed, plants from these three places, and from different localities surrounding them, all have the characteristic smooth bristles. I have not found any other form near Chicago. In 1878 a few plants of the variety were discovered growing with the typical species at Torch Lake, Mich. Having observed it in four different places, and for several years, the variety may be regarded as constant, and be distinguished as above.

Fimbristylis autumnalis, Roem. & Schult. At Whiting. Nut pale yellow, prominently covered with stipitate tubercles or wart-like projections. Torrey, in his "Cyperaceae" under *Trichelostylis mucronulatus*, mentions these tubercles, and Chapman, in his "Flora of the Southern States." Grows in abundance in moist sands.

Hemicarpha subsquarrosa, Nees, var. *Drummondii*, Gray. At Millers, Ind.

Carex Emmonsii, Dew. A variety with the bracts considerably longer than the culm. At Whiting.

Triticum violaceum, Hornemann. Not uncommon at Whiting.

Selaginella selaginoides, Link. Mackinac, in springs above the cliff known as the "Lover's Leap." In Wheeler and Smith's Catalogue only credited to Isle Royal.

Selaginella rupestris, Spring. Grows on sand hills at Millers, at Manistee, and near Traverse City. Associated at Millers and Manistee with *Hudsonia tomentosa*. The little plant is often nearly buried in the shifting sands.

Lechea Novæ-Caesareæ, C. F. Austin. In open sandy woods, near Tolleston, Lake Co., Ind. Having found, last September, what I took to be this plant, specimens were sent to Wm. H. Leggett, of New York, who makes a specialty of this genus, and the determination was sustained.

Goodyera pubescens.—During the summer of 1880, desiring to get a flowering specimen of the above named plant to press, I visited the well-known locations hereabouts throughout the season, but was unable to find a solitary plant in flower, nor do I think any of the plants in this neighborhood flowered. The previous year there were the usual number of flowering plants, and so there are this year. It would be interesting to know if this is a common occurrence or the result of an accident.—JOSEPH MEEHAN, *Germantown, Phila.*

"Our Native Ferns."—This is the title of a very neat and handy volume by Lucien M. Underwood, of the Wesleyan University, Bloomington, Illinois.

The author has adopted the plan of Gray's Lessons and Manual for his work, dividing it into two parts, the first being devoted to a brief study of the habits, structure and classification of ferns, with appropriate sections on germination, fructification and the identification of species, and the second part to a systematic description of genera and species arranged in accordance with an original synoptical key.

As will readily be seen, the plan is an excellent one, and has been well carried out by the author, who is not only deserving of great credit, but the thanks of all fern students as well.

The sections of the first part are well calculated to introduce a beginner to the study of the interesting plants of which the author has himself been so appreciative a student, and contain scarcely anything for adverse criticism. It is, however, to be regretted that the term "*rhizoma*" should have been used in so broad and general a sense as to include all kinds of rootstocks. The term has a more restricted meaning to which it should be limited, merely standing for one kind of a rootstock, just as a caudex does for another kind.

If one general term is to be used it is better to adopt that of "rootstock" in accordance with the excellent practice of Prof. Eaton in Ferns of N. Am., a work, by the way, with which Mr. Faxon's name ought to have been associated in the chapter on "Fern Literature." The artificial synopsis is an excellent one, that will prove to be of much service to amateurs in identifying specimens, and, so far as examined, the descriptions are concise and clear.

The illustrations, although not of a very high order, assist the explanations in the text, which throughout is clearly written. The two glossaries of technical terms at the end might as well have been combined in one, and it may be in place in connection with them to state that *Aspidium Boottii* was named for Wm. Boott, who discovered it, and not Dr. Francis. The author's views in general are conservative, and his book, which is to be commended, will no doubt serve the purpose for which it was intended admirably.—GEO. E. DAVENPORT.

Nasturtium lacustre.—I found this plant in a little pond near Lincoln, Ill. It had been flowering for some time, and as the racemes grew longer, the plant seemed to sink lower and lower into the water. Some had a few leaves still above the water, but most of them had ev-

en a part of the racemes immersed, so that only the flowering portion was visible. The pods were therefore kept under water, and I rarely found one to have ripened seeds and I doubt whether these would have germinated. As the pods were slightly inflated I concluded that they served to hold the still flowering portion above water. If the pods ripen but rarely the plant must have other means of propagation since it spreads rapidly. And these it has, for it was found to spread abundantly by means of branches from the base of the stems trailing along the bottom of the pond and striking roots as they grow. About the flowering season, the much divided immersed leaves break off from the stem. Just above their bases a small branch appears. The base of the parent leaf curves downwards into the water, so that the branches as they grow larger are enabled to float on the water, by bending away from the parent leaf so that the midrib of the parent leaf and the stem of the branch are in the same line. While still small the roots appear at the base of the stem and run up the curved base of the parent leaf for a distance of one-fourth inch from the base; in this manner they are sometimes above water but still appearing to be in good health. Here my observations ceased. Whether these rootlets derive nutriment from the parent leaves, if they continue to grow until they reach the tip of the leaves, I know not. But in a month they had all become attached to the bottom of the pond. Still it seems probable that as the base of the stem becomes too heavy to float it sinks into the water, the heavy parent leaves begin to rot and hang vertically and so direct the roots into the soil, at the same time affording nutriment, which it as yet does not obtain from the ground.—

AUG. F. FOERSTE, *Dayton, Ohio.*

Hieracium aurantiacum, L.—*Hieracium aurantiacum* (not *aurantium*, as printed at p. 248.) I have had sent to me several times from correspondents in the Eastern States during the past twenty years, and sometimes from stations which suggested that this plant may possibly be indigenous. It would be well, before the plant becomes too common for the purpose, to note the surroundings, so as to judge of the mode of introduction if possible. Miss Mary S. Cope, of the Ladies' Botany Club of Germantown, collected fine specimens on the Catskills in July of this year. A native of Siberia, according to Gmelin, there is no reason why it may not be indigenous in some of our higher mountains, the chief objection to this view being its apparent rapid spread of late years. A plant of its character would, in all probability, have been more widely distributed if truly indigenous. Still I think it would be well to have a note of all the stations and conditions under which they grow.—THOMAS MEEHAN.

Albinism.—White flowers of species normally blue or red are comparatively common. It does not seem to be on record that colored flowers ever come from those normally white. The white varieties of colored species, when under culture, continue to reproduce white flowers, at least I never knew one to revert till now. I enclose the specimen *Wahlenbergia grandiflora*. One single blue flower has come

out from the stalk which bore all others white. I have also one plant from the white seed which so far has produced blue flowers. It establishes the fact that an albino can revert to its normal color.—
THOMAS MEEHAN.

Rootstocks of Convolvulus sepium.—In a recent visit to Fredericton, N. B., my brother, Prof. L. W. Bailey, of the University of New Brunswick, called my attention to the peculiar rootstock of *Convolvulus sepium*. The Indians of the Melicete tribe had, he said, shown these to him on the islands in the river, as articles of food. They are long and moniliform, the expanded, tuberous portions being quite round and hard, and the whole root being several feet in length. Upon consulting descriptions of the plant at hand, I find no allusion to these rootstocks being moniliform. They would seem to be quite characteristic.—W. W. BAILEY, *Brown University, Providence, R. I.*

Nymphæa odorata.—We learn from our text-books that the flowers of *Nymphæa* open in the day, and after fertilization are drawn under water by the contraction of the peduncle, where the fruit ripens. But of the means of dissemination furnished by nature to the seed, they say nothing.

Mr. R. H. Warder, son of Dr. John A. Warder, has a number of fine specimens of various species, *N. alba*, *N. odorata*, *N. tuberosa*, (*?*) &c., growing in an artificial pond on his father's place, near North Bend, Ohio. He has observed that numbers of seedling plants are coming up around the margin of the pond, and was for a time at a loss to know how the seeds strayed away from the neighborhood of the parent plant, if they were ripened under water and planted themselves on the the bottom, for the seed, as he knew, is of a greater specific gravity than water , and there was no current in the pond, and the water is never agitated so as to disturb the sediment. While gathering flowers he observed floating on the water, something resembling frog-spittle. A quantity was collected, placed in a vessel, and upon examination proved to be seeds of *Nymphæa* enveloped by the membranaceous aril, as described by the authors. This sac though open at the top still contains enough air to float the seed for some time, and thus by favoring winds or currents, it may be transported to some distance from the parent. A number of specimens kindly brought to the writer by Mr. Warder, remained afloat in a bottle, after being roughly handled in transportation, for abouttwenty-four hours, when they escaped from the membranaceous envelope, through its partial decay probably, and sank to the bottom, the sacs still floating. There being little chance, as Dr. Warder says, for a new plant to establish itself among the mass of roots of a *Nymphæa* bed, this means for the transportation of the seed to a favorable locality, will account partly for the wide distribution of the genus. Winds and currents would carry them to a distance while still contained in the sac, and when that buoy has lost its buoyancy, or through its decay, the seed drops in a favorable place, and a new plant will be estab-

lished. The specimens producing the seeds described are, the writer thinks, a variety of *N. odorata*, contrary to the opinion of Mr. Warder, who inclines to think them *N. tuberosa*. The flowers are large for *N. odorata*, less odorous, and the leaves of some of them are raised above the water's surface like the older leaves of *Nelumbium*, but the seeds are oblong, and raised on a stipe within the arillus which is much longer than the seed; while in *N. tuberosa* the arillus is shorter, the seed round and not stipitate.

These observations have been mostly made by Dr. Warder and his son, by whose request they are placed on record by

DAVIS L. JAMES.

Scales of Thuja gigantea 3-ovuled—I have long known that the scales of *Thuja gigantea*, Nutt., were three-ovuled and usually three-seeded, but do not see it noted in any of the books I have examined. The seeds are imbricate, that is, the wings of the two outside ones overlap the inner one. I see no difference in the wings, both sides being alike in all I have examined.

The genus *Thuja* as laid down in the botany of California will have to be amended to include this species as it grows in this vicinity.

Another thing I have not seen noted; it annually sheds, not only its leaves, but its branchlets. These turn yellow in the fall and drop off in a few weeks.—THOMAS HOWELL, *Sauvies Island, Oregon.*

Plants of North-Western Australia, enumerated by Baron Ferdinand von Mueller.—This folio pamphlet of twenty pages comes from a strange country with a list of still stranger plants. The north-western part of Australia had never been explored botanically before 1861, at which time about 120 species were recorded. The present list is made from a collection of Mr. John Forrest while engaged in a trigonometrical survey of the Nickol Bay District during the year 1878. "Among the plants given as of more than ordinary interest are the real Caper-plant (*Capparis spinosa*), not specifically distinct from the Mediterranean typical plant; the Strychnia-bush (*Strychnos nux-vomica*); the ordinary Haricot Bean (*Phaseolus vulgaris*); *Hibiscus Goldsworthii* a highly ornamental shrub; *Eremophila Fraseri*, a bush of showy splendor; the *Decaesia* (a new genus of *Compositæ*), an elegant everlasting, the glorious Marie Palm (*Livistona Mariæ*), the only palm as yet known from the west coast of Australia, restricted there seemingly to a solitary locality."

"Strange, however, is the almost total absence of ferns, only *Acrostichum aureum* representing that otherwise large and lovely order among about 400 species of plants now gradually accumulated in collections from the district."

The arrangement of orders is most bewildering to the American botanist, doing violence to all his ideas of system. Apetalous, monopetalous and polypetalous orders are to be found mixed in every way. It also looks queer to see the genus *Andropogon* among the *Amarantaceæ*, as well as among Grasses. The country is a great one, though, and many a rich harvest of plants is waiting to be reaped.